EVERETT M.
BROOKS
COMPANY

PROJECT ADDRESS: 17 Cushing Street
Newton, MA
PROJECT NO.: 24373
SHEET: 1 **OF:** 7
CALCULATIONS BY: ES **DATE:** 1/9/15
CHECKED BY: MSK **DATE:** 1/9/15

PRE-POST DRAINAGE CALCULATIONS

RATIONAL METHOD Q = ciA
RAINFALL INTENSITY (i) FROM U.S. WEATHER BUREAU T.P. 40
RUNOFF COEFFICIENTS (c): 0.30 GRASS
0.90 IMPERVIOUS

EXISTING CONDITIONS

AREA = 0.20 ACRES
Tc = 5 MINUTES i(100) = 10.0 IN/HR

$$c = \frac{(0.06)(0.90)+(0.14)(0.30)}{(0.20)} \qquad c = 0.48$$

Q(100) = (0.48)(10.0 IN/HR)(0.20 AC) = 0.96 CFS

PROPOSED CONDITIONS (UNDETAINED)

AREA = 0.20 ACRES
Tc = 5 MINUTES i(100) = 10.0 IN/HR

$$c = \frac{(0.10)(0.90)+(0.10)(0.30)}{(0.20)} \qquad c = 0.60$$

Q(100) = (0.60)(10.0 IN/HR)(0.20 AC) = 1.20 CFS

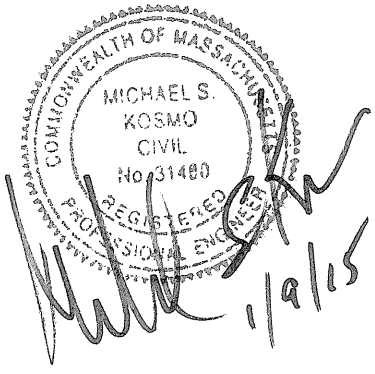
PROPOSED CONDITIONS (DETAINED)

AREA = 0.09 ACRES
Tc = 5 MINUTES i(100) = 10.0 IN/HR

$$c = \frac{(0.0)(0.90)+(0.09)(0.30)}{(0.09)} \qquad c = 0.30$$

Q(100) = (0.30)(10.0 IN/HR)(0.09 AC) = 0.27 CFS

PEAK FLOW DECREASE = 0.69 CFS



Note: See Plan entitled "Site Plan of Land in Newton, MA, 17 Cushing Street."

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********** Q-CADD: TR_20 **********
****
PROJECT ID: 17 CUSHING STREET COMPUTED BY: ES DATE: PAGE: 2

WATERSHED: GARAGE ROOF RUNOFF

INPUT DATA

FREQUECY:	100.00	years
24-HR.SCS TYPE III RAINDFALL:	7.00	inches
AREA:	0.02	acres
LENGTH:	50.00	feet
SLOPE:	25.00	percent
CURVE NUMBER:	98.00	*
IMPERVIOUS AREA:	0.02	acres
HYD. LENGTH IMPROVED:	0.00	feet
POND/ SWAMP FACTOR:	1.00	*

(PONDS/ SAMPS NO CORRECTION)

COMPUTED DATA

LAG CORR. (IMPERV. SURF.)	0.866	*
LAG CORR. (HYD.LEN.MOD.):	1.000	*
WATERSHED LAG:	0.002	hours
TIME OF CONCENTRATION:	0.004	hours
RUNOFF DEPTH:	3.654	inches
RUNOFF VOLUME:	0.005	acre-feet
TIME OF PEAK:	12.100	hours
PEAK FLOW:	0.05	c.f.s.

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********** Q-CADD: TR_20 **********
****
PROJECT ID: 17 CUSHING STREET COMPUTED BY: ES DATE: PAGE: 3

WATERSHED: TRENCH DRAIN

INPUT DATA

FREQUECY:	100.00	years
24-HR.SCS TYPE III RAINDFALL:	7.00	inches
AREA:	0.04	acres
LENGTH:	79.00	feet
SLOPE:	2.00	percent
CURVE NUMBER:	83.00	*
IMPERVIOUS AREA:	0.03	acres
HYD. LENGTH IMPROVED:	0.00	feet
POND/ SWAMP FACTOR:	1.00	*

(PONDS/ SAMPS NO CORRECTION)

COMPUTED DATA

LAG CORR. (IMPERV. SURF.)	0.672	*
LAG CORR. (HYD.LEN.MOD.):	1.000	*
WATERSHED LAG:	0.018	hours
TIME OF CONCENTRATION:	0.030	hours
RUNOFF DEPTH:	5.032	inches
RUNOFF VOLUME:	0.018	acre-feet
TIME OF PEAK:	12.100	hours
PEAK FLOW:	0.23	c.f.s.

WATERSHED: HOUSE ROOF RUNOFF

INPUT DATA

FREQUECY:	100.00	years
24-HR.SCS TYPE III RAINDFALL:	7.00	inches
AREA:	0.05	acres
LENGTH:	150.00	feet
SLOPE:	25.00	percent
CURVE NUMBER:	98.00	*
IMPERVIOUS AREA:	0.05	acres
HYD. LENGTH IMPROVED:	0.00	feet
POND/ SWAMP FACTOR:	1.00	*

(PONDS/ SAMPS NO CORRECTION)

COMPUTED DATA

LAG CORR. (IMPERV. SURF.)	0.866	*
LAG CORR. (HYD.LEN.MOD.):	1.000	*
WATERSHED LAG:	0.006	hours
TIME OF CONCENTRATION:	0.010	hours
RUNOFF DEPTH:	4.747	inches
RUNOFF VOLUME:	0.018	acre-feet
TIME OF PEAK:	12.100	hours
PEAK FLOW:	0.19	c.f.s.

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LEACHING GALLEY DESIGN

PROVIDE TWO (2) LEACHNG GALLEYS 4' X 4' X 2.5' DEEP, WITH 3.5' STONE ON THE SIDES OF THE GALLEYS AND 6" OF STONE BENEATH THE ENTIRE SYSTEM.

CAPACITY

$$Q = \frac{A*(1+n)}{60*(12PR)}$$

Q = OUTFLOW (CFS)
A = EFFECTIVE LEACHING AREA (S.F.)
n = POROSITY OF SOIL
PR = PERCOLATION RATE (MPI)

AREA

SIDEWALL	=	(15)(3.75)(2)+(11)(3.75)(2)	=	195 S.F.
BOTTOM	=	(15)(11)	=	165 S.F.
				360 S.F.

VOLUME

LINER	=	(8)(4)(3.25)	=	104 C.F.
STONE	=	[(15)(11)(3.75)-104]*(0.4)	=	206 C.F.
				310 C.F.

CAPACITY

$$Q = \frac{360*(1.3)}{60*[12(2)]}$$

Q = 0.3250 C.F.S.

Note: See Plan entitled "Site Plan of Land in Newton, MA, 17 Cushing Street."

SURVEYORS & ENGINEERS
49 Lexington Street West Newton, MA 02465 (617) 527-8750 Fax: (617) 332-1578 www.everettbrooks.com

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**********Q-CADD: STAGE/STORAGE/DISCHARGE **********
****
PROJECT ID: 17 CUSHING STREET COMPUTED BY: ES DATE: PAGE: 6

DETENTION BASIN FILE NAME: GALL

Point (#)	Stage (feet)	Storage (cu. Ft.)	Discharge (cfs)
01	0.00	0.0	0.00
02	3.75	310.0	0.33

24 HR. SCS TYPE III, 100 YEAR STORM
HYDROGRAPH FILE "RUNOFF" ROUTED THROUGH D-BASIN FILE: "GALL"

File Name (*)	Peak Flow (cfs)	Peak Time (hrs)	Volume (ac.-ft.)
RUNOFF	0.47	12.10	0.042
<OUTFLOW>	0.31	12.15	0.041

Peak Elevation: 3.54 feet Flood Storage: 292.3 cu.ft.

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OPERATIONS & MAINTENANCE PLAN

Driveway Sweeping:

1. The driveway shall be inspected at least every six months for sweeping.
2. Sweeping shall be completed at least twice per year.
3. Sweeping shall be completed immediately following final snowmelt and the completion of winter sanding.

Leaching Galley/Drywell Drainage Systems:

1. The drainage systems shall be inspected at least once every year to ensure that they are operating as intended. Inspections shall be conducted during wet weather.
2. Sediment shall be removed from the chambers as necessary, and at least once every two- (2) years.
3. All sediment and hydrocarbons shall be properly handled and disposed, in accordance with local, state and federal guidelines and regulations.
4. Sediment removal shall be by vacuum cleaning.

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